

AQA GCSE Chemistry: Higher

Advance Information of Assessed Content 2022

Link to specification: [GCSE Chemistry Specification Specification for first teaching in 2016 \(aqa.org.uk\)](https://www.aqa.org.uk/qualifications/gcse-chemistry/specification)

Link to advance information document: [Advanced information June 2022 - GCSE Chemistry \(8462\) \(aqa.org.uk\)](https://www.aqa.org.uk/qualifications/gcse-chemistry/advance-information)

Chemistry Paper 1 - H

These specification points will be the **major focus** of this paper.

Exam date: 27th May

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Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.1.2 The Periodic Table	<ul style="list-style-type: none"> -The Periodic Table is arranged in order of proton number -What atoms of elements in the same group have in common -What atoms of elements in the same period have in common -development in the Periodic Table -ions formed from metals and non-metals -trends in physical and chemical properties of group 1, 7 and 0 elements - Reactions of group 1 and 7 elements 	20-26	https://www.bbc.co.uk/bitesize/guides/z3sg2nb/revision/1 https://www.bbc.co.uk/bitesize/guides/zg923k7/revision/1 https://www.bbc.co.uk/bitesize/guides/zqwtcj6/revision/1	https://www.youtube.com/watch?v=IdS9roW7lzM&t=119s https://www.youtube.com/watch?v=uwzXfZoCP_k https://www.youtube.com/watch?v=dZGDUKQa_6g https://www.youtube.com/watch?v=HT1zAPQIBAQ
4.2.1 Chemical bonds, ionic, covalent and metallic	<ul style="list-style-type: none"> -Describe the process of ionic bonding -Describe the process of covalent bonding -Describe the process of metallic bonding -explain chemical bonding in terms of electrostatic forces and the transfer or sharing of electrons. -work out the charge on the ions of metals and non-metals from the group number of the element, limited to the metals in Groups 1 and 2, and non-metals in Groups 6 and 7 -Describe the structure of ionic compounds -draw dot and cross diagrams for the molecules of hydrogen, chlorine, oxygen, nitrogen, hydrogen chloride, water, ammonia and methane -Describe the structure of metals 	28-31, 35	https://www.bbc.co.uk/bitesize/guides/zyydn8/revision/1 https://www.bbc.co.uk/bitesize/guides/zcpjfcw/revision/1 https://www.bbc.co.uk/bitesize/guides/z8db7p3/revision/1	https://www.youtube.com/watch?v=6DtrrWA5nKE https://www.youtube.com/watch?v=lenvZEcmC60 https://www.youtube.com/watch?v=IhEm7aAKIDg https://www.youtube.com/watch?v=5l_1jRGSr9E https://www.youtube.com/watch?v=b1y2Q6YX1bQ https://www.youtube.com/watch?v=A-wTpLPICd0&t=13s

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4.2.2 How bonding and structure are related to the properties of a substance	<ul style="list-style-type: none"> -interpreting melting and boiling point data to determine state at a certain temp -link energy needed to change state to strength of forces between particles -state symbols -describe & explain properties of ionic compounds -describe & explain properties of simple covalent molecules -describe & explain properties of polymers -describe & explain properties of metals and alloys 	28-32, 35-37	https://www.bbc.co.uk/bitesize/guides/zyydn8/revision/1 https://www.bbc.co.uk/bitesize/guides/zcpjfcw/revision/1 https://www.bbc.co.uk/bitesize/guides/z9twsrd/revision/1 https://www.bbc.co.uk/bitesize/guides/z8db7p3/revision/1	https://www.youtube.com/watch?v=leVxy7cjZMU https://www.youtube.com/watch?v=DECGNyC-x_s https://www.youtube.com/watch?v=EP0zfm_FVqc https://www.youtube.com/watch?v=A-wTpLPICd0
4.2.3 Structure and bonding of carbon	-describe and explain the properties of diamond, graphite, graphene and fullerenes	33-34	https://www.bbc.co.uk/bitesize/guides/z9twsrd/revision/1	https://www.youtube.com/watch?v=tGH0mXCcEFU

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4.3.2 Use of amount of substance in relation to masses of pure substances	<ul style="list-style-type: none"> -calculating relative formula mass -calculating the number of moles in a given mass of a substance, calculating the mass of a certain no. of moles of a substance -Avogadro's constant – the number of particles in 1 mole of every substance -calculate the masses of reactants and products from the balanced symbol equation and the mass of a given reactant or product. -using molar ratios to balance equations -identifying limiting reactants and explaining the effect on yield of products -define concentration of a solution -calculate the concentration of a solution, or the mass of a solute dissolved in a given volume to create a solution of given concentration 	41-47	https://www.bbc.co.uk/bitesize/guides/zgcyw6f/revision/1 https://www.bbc.co.uk/bitesize/guides/z3kg2nb/revision/1	https://www.youtube.com/watch?v=q49NwlrjaFw https://www.youtube.com/watch?v=wPGVQu3UXpw https://www.youtube.com/watch?v=TV6n5MFH6IU https://www.youtube.com/watch?v=YKvUQ2cPmJg https://www.youtube.com/watch?v=MuzOmFhiE8o https://www.youtube.com/watch?v=3G3KQIyoZDI

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4.4.1 The Reactivity of Metals	<ul style="list-style-type: none"> -Metals + oxygen -Reduction and oxidation in terms of oxygen -reduction and oxidation in terms of electrons -identify in a given reaction, symbol equation or half equation which species are oxidised and which are reduced -The Reactivity Series - Displacement reactions - Extraction of metals by reduction 	55-57	https://www.bbc.co.uk/bitesize/guides/zsm7v9q/revision/1	https://www.youtube.com/watch?v=Lk1V0buHEFs https://www.youtube.com/watch?v=gnbuTl2aril https://www.youtube.com/watch?v=2i5Lm7BMtpo https://www.youtube.com/watch?v=MXTSels6e2Y
4.4.2 Reactions of Acids	<ul style="list-style-type: none"> -Naming Salts -products of the reactions of acids and metals -explain the reactions of metals and acids in terms of loss and gain of electrons -products of the reactions of acids and alkalis and insoluble bases -products of the reactions of acids and metal carbonates -pH scale and neutralisation -difference between strong and weak acids 	51,53-54	https://www.bbc.co.uk/bitesize/guides/zcijfcw/revision/1	https://www.youtube.com/watch?v=ofw6oHSYGF1 GCSE Science Revision Chemistry "Acids Reacting with Metals 2" - YouTube https://www.youtube.com/watch?v=QISsle_jSQ8
4.4.2.3 and Required Practical 1: preparation of a pure, dry sample of soluble salts	<ul style="list-style-type: none"> -method of producing solid salt crystals from insoluble oxide or carbonate and acids -identifying errors in methods and reagents 	Bottom half pg 54	https://www.bbc.co.uk/bitesize/guides/zcijfcw/revision/6	https://www.youtube.com/watch?v=9GH95172Js8&t=16s GCSE Science Revision Chemistry "Strong and Weak Acids" – YouTube

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Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.4.2.5 and Required practical 2: determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration.	<ul style="list-style-type: none"> -Method -control variables and how to monitor them -quantitative analysis of results 	52	https://www.bbc.co.uk/bitesize/guides/zx98pbk/revision/1	https://www.youtube.com/watch?v=saRBT5oZfh8 https://www.youtube.com/watch?v=vn3Rx3g1VPk https://www.youtube.com/watch?v=x8DLLCNMKAs https://www.youtube.com/watch?v=ycC4oKteRJu
4.4.3 Electrolysis	<ul style="list-style-type: none"> -The process of electrolysis -identifying oxidation and reduction in terms of electrons -writing half equations for oxidation/reduction reactions occurring at each electrode -Electrolysis of molten ionic compounds -Electrolysis of aluminium oxide -Electrolysis of aqueous solutions, predicting products formed 	58-59	https://www.bbc.co.uk/bitesize/guides/zcsyw6f/revision/1	https://www.youtube.com/watch?v=AhTRiL6xjBA&t=2s https://www.youtube.com/watch?v=iINOpROacf0 https://www.youtube.com/watch?v=YcyMEIBEzAY https://www.youtube.com/watch?v=6WjC_Vi4roA https://www.youtube.com/watch?v=W9ngXNxSyoo

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Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.5.1 Exothermic and endothermic reactions	<ul style="list-style-type: none"> -describe the law of the conservation of energy -define exo and endothermic reactions and describe their features -give examples of exo and endothermic reactions -define activation energy -represent exo and endothermic reactions with reaction profiles -describe bond breaking in the reactants as an endothermic process -describe bond formation in the products as an exothermic process -calculate the energy transferred in chemical reactions using bond energies supplied -Use energy change values to identify if a reaction is exo/endothermic 	61-63	https://www.bbc.co.uk/bitesize/guides/zwfr2nb/revision/1	https://www.youtube.com/watch?v=4HS6D0hTzdg https://www.youtube.com/watch?v=dstRL5xB0Sk https://www.youtube.com/watch?v=it0HGxhxD-s https://www.youtube.com/watch?v=eExCBkp4jB4 https://www.youtube.com/watch?v=PdValXAVUOc
Required Practical 4: investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, carbonates, neutralisations, displacement of metals	<ul style="list-style-type: none"> -Identifying independent, dependent, control variables -Analysing results -identifying exo and endothermic reactions from experimental results 	62	https://www.bbc.co.uk/bitesize/guides/zwfr2nb/revision/2	https://www.youtube.com/watch?v=Bz0C9mmF2tw

Chemistry Paper 1 - H

Exam date: 20th June

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Spec point	CGP Revision Guide Pages
4.2.4 Bulk and surface properties of matter including nanoparticles	38-39

Chemistry Paper 2 - H

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Exam date: 20th June

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Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.6.1 Rate of Reaction	<ul style="list-style-type: none"> -Calculating the rate of a reaction -Calculate the gradient of a tangent to the curve on these graphs as a measure of rate of reaction at a specific time. -Describe collision theory -Define activation energy -Describe and explain the factors that increase the rate of reaction -Describe and explain the effect of catalysts on rate of reaction 	67-71	https://www.bbc.co.uk/bitesize/guides/z3nbqhv/revision/1	https://www.youtube.com/watch?v=UkrBJ6-uGFA https://www.youtube.com/watch?v=GCR5xeduq2o https://www.youtube.com/watch?v=-4HXaUBbv04 https://www.youtube.com/watch?v=hel8fQjxcO8
Required Practical 5: investigate how concentration affects the rates of reaction by a method involving measuring the volume of a gas produced/change in colour	<ul style="list-style-type: none"> -identify independent, dependent and control variables -describe how to measure the dependent variable -analyse results and draw conclusions from graphed data -calculate rate of reaction from data 	70	Required practical - measure the production of a gas - Rates of reaction - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize	https://www.youtube.com/watch?v=N5p06i9ilmo https://www.youtube.com/watch?v=GI6LVI7oAIU

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Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.6.2 Reversible reactions and dynamic equilibrium	<ul style="list-style-type: none"> -Identify and give examples of reversible reactions -Apply the conservation of energy to reversible reactions -Define dynamic equilibrium -Describe Le Chatelier's principle -Describe and explain the effect of changing the following conditions on equilibrium; concentration, temperature, pressure 	72-73	https://www.bbc.co.uk/bitesize/guides/zyhvw6f/revision/1	https://www.youtube.com/watch?v=66qcNNJFy6E GCSE Science Revision Chemistry "Concentration and Reversible Reactions" – YouTube GCSE Science Revision Chemistry "Pressure and Reversible Reactions" – YouTube GCSE Science Revision Chemistry "Temperature and reversible reactions" – YouTube GCSE Chemistry - Le Chatelier's Principle #42 (Higher Tier) – YouTube

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Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.7.1 Carbon compounds as fuels and feedstock	<ul style="list-style-type: none"> -describe crude oil as a mixture of different length hydrocarbons -define the term hydrocarbon -identify the first 4 alkanes from their chemical formula and name them -Describe the trend in properties as hydrocarbon chain length increases -Describe and explain the process of fractional distillation -describe the process of cracking -describe the use of alkenes 	75-78	https://www.bbc.co.uk/bitesize/guides/zshvw6f/revision/1	https://www.youtube.com/watch?v=CX2IYWggEBc https://www.youtube.com/watch?v=3I7yCkSXPos https://www.youtube.com/watch?v=7AWwjKbRa_o
Required practical 7: use of chemical tests to identify the ions in unknown single ionic compounds covering the ions from sections Flame tests through to Sulfates.	<ul style="list-style-type: none"> -Describe reagents and positive results for each ion -Describe method of flame tests 	88-89	https://www.bbc.co.uk/bitesize/guides/zxtvw6f/revision/1	https://www.youtube.com/watch?v=Bd0A44lv2OI&t=96s https://www.youtube.com/watch?v=4iZRs4XIJOE https://www.youtube.com/watch?v=mWTgHjdea4Y https://www.youtube.com/watch?v=fCZztwJmAlO

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Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.9.1 The composition and evolution of the Earth's Atmosphere	<ul style="list-style-type: none"> -describe the composition of the current atmosphere -describe the composition of the early atmosphere and explain theories of how the early atmosphere formed -explain how the early atmosphere changed to that of the present atmosphere 	91	https://www.bbc.co.uk/bitesize/guides/zg4qfcw/revision/1	https://www.youtube.com/watch?v=t1Z3GInIdLA https://www.youtube.com/watch?v=l0h-3MOPso
4.10.1 Using the Earth's resources and obtaining potable water	<ul style="list-style-type: none"> -Describe the renewable and non-renewable resources that we get from the Earth and its atmosphere -Define the term potable water -Describe how potable water can be produced. -Describe the differences in the treatment of waste water, salt water and ground water -Describe and evaluate alternative methods of extracting metals e.g. phytomining and bioleaching 		https://www.bbc.co.uk/bitesize/guides/zgqhcj6/revision/1 https://www.bbc.co.uk/bitesize/guides/zpcjsrd/revision/1 Biological methods of metal extraction - Higher - Ways of reducing the use of resources - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize	https://www.youtube.com/watch?v=-XczTGavTZU https://www.youtube.com/watch?v=n7pYRQs20bl https://www.youtube.com/watch?v=b5RVPauf4oM

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4.10.4 The Haber process and the use of NPK fertilisers	<ul style="list-style-type: none"> -Describe the purpose of the Haber process, the reaction and raw materials involved -interpret graphs of reaction conditions versus rate -apply the principles of dynamic equilibrium in Reversible reactions and dynamic equilibrium (4.6.2) to the Haber process -explain the trade-off between rate of production and position of equilibrium -explain how the commercially used conditions for the Haber process are related to the availability and cost of raw materials and energy supplies, control of equilibrium position and rate -Describe NPK fertilisers as formulations of various salts containing appropriate percentages of the elements. -Describe the composition of NPK fertilisers and how they are made -recall the names of the salts produced when phosphate rock is treated with nitric acid, sulfuric acid and phosphoric acid 	104-105	https://www.bbc.co.uk/bitesize/guides/z9tvw6f/revision/1	https://www.youtube.com/watch?v=1_HoWz5Kxfk https://www.youtube.com/watch?v=HAKaD6-7fgQ https://www.youtube.com/watch?v=rKzt9BvvEeQ

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Spec point	CGP Revision Guide Pages
4.9.2 Carbon dioxide and methane as greenhouse gases	92-94